1. (Currently Amended) A method for manufacturing of ~~a photo mask blank, in particular of a binary photo mask blank, a phase shifting photo mask blank or~~ an extreme ultra violet ~~photo~~ mask blank, comprising the steps of:

providing a substrate and a target in a vacuum chamber,

providing a first particle beam,

sputtering said target by irradiating with said first particle beam,

depositing at least a first layer of a first material on said substrate by said sputtering of said target, whereby film stress is optimized to about 0.2 MPa or less by adjusting the angle of incidence of the sputtered target atoms.

2.-(Previously Presented) The method of claim 1, wherein said first particle beam is directed onto said target and sputtered particles emerge from said target in direction to said substrate.

3. (Currently Amended) The method of claim 1, wherein at least a second layer of a second material is deposited on said ~~photo~~ extreme ultraviolet mask blank by sputtering of said target.

4. (Previously Presented) The method of claim 1, wherein said target defines a target normal line and said first particle beam hits said target under an angle to said target normal line.

5. (Currently Amended) The method of claim 1, wherein said substrate defines a substrate normal line and sputtered particles from said target hit said ~~photo~~ extreme ultraviolet mask blank under an angle to said substrate normal line.

6. (Currently Amended) A method for manufacturing of [[a]] an ~~photo~~ extreme ultraviolet mask blank, comprising the steps of:

providing a substrate and a target in a vacuum chamber,

providing a first particle beam,

sputtering said target by irradiating with said first particle beam,

depositing at least a first layer of a first material on said substrate by said sputtering of said target, wherein the rate of depositing of said first layer is between 0.05 and 5 nm/sec.

7. (Currently Amended) The method of claim 1, wherein said ~~photo~~ extreme ultraviolet mask blank is irradiated by a second particle beam.

8. (Currently Amended) The method of claim 7, wherein said substrate defines a substrate normal line and said second particle beam hits said ~~photo~~ extreme ultraviolet mask blank under an angle to said substrate normal line.

9. (Previously Presented) The method of claim 7, wherein at least one of said first and second particle beam comprises an ion beam.

10. (Previously Presented) The method of claim 7, wherein at least one of said first and second particle beam comprises an ion beam, which is accelerated and focused by an electromagnetic field.

11. (Previously Presented) The method of claim 7 wherein said first and second particle beams are separately controlled for independently depositing layers by said first particle beam and treating at least one of said substrate and said layers by said second particle beam.

12. (Previously Presented) The method of claim 7, wherein said first and second particle beams comprise different particles.

13. (Previously Presented) The method of claim 7, wherein said first and second particle beams have different particle energies.

14. (Previously Presented) The method of claim 7, wherein a surface of said substrate is conditioned by irradiating with said second particle beam.

15. (Cancelled)

16. (Cancelled)

17. (Previously Presented) The method of claim 7, wherein said at least one reactive gas comprises oxygen.

18. (Previously Presented) The method of claim 7, wherein at least one of the layers is doped by irradiating with said second particle beam.

19. (Currently Amended) The method of claim 18, wherein a plurality of layers is deposited on said ~~photo~~ extreme ultraviolet mask blank and different layers are differently doped.

20. (Previously Presented) The method of claim 18, wherein at least one of the following parameters:

optical density,

etch time,

adhesion and

reflectance

of at least one of the layers is controlled by said doping.

21. (Previously Presented) The method of claim 7, wherein a surface of at least one of the layers is flattened by irradiating with said second particle beam after the deposition of said at least one layer.

22. (Currently Amended) The method of claim 7 wherein further layers are deposited on said ~~photo~~ extreme ultraviolet mask blank and interface roughness between said layers is reduced by irradiating with said second particle beam.

23. (Previously Presented) The method of claim 7 wherein reflectance of a surface of a reflecting layer is increased by irradiating with said second particle beam.

24. (Previously Presented) The method of claim 1 wherein said first particle beam comprises an ion beam.

25. (Previously Presented) The method of claim 24 wherein said ion beam is a Xenon ion beam.

26. (Currently Amended) The method of claim 25 wherein reflectance of a surface of a reflecting layer is increased by sputtering the target by irradiating with said Xenon ion beam, whereby the sputtering is carried out at a background pressure between $1*10^{7}$ Torr and $3*10^{10}$ Torr.

27. (Currently Amended) A method for manufacturing of ~~a photo~~ an extreme ultraviolet mask blank, comprising the steps of:

providing a substrate and a sputter target in a vacuum chamber,

providing a deposition particle source and an assist particle source,

providing a first and second particle beam by means of said deposition and assist particle source, respectively,

sputtering said target by irradiating with said first particle beam, wherein said first particle beam is directed from said deposition particle source onto said target and sputtered particles emerge from said target in direction to said substrate,

depositing at least a first layer of a first material on said substrate by said sputtering of said target,

depositing at least a second layer of a second material on said first layer by sputtering of said target,

irradiating said ~~photo~~ <u>extreme ultraviolet</u> mask blank with said second particle beam for treating said substrate or at least one of said layers, wherein the reflectance of a surface of a reflecting layer is increased by sputtering the target by irradiating with a Xenon ion beam.

28. (Cancelled)

29. (Currently Amended) ~~The photo~~ <u>A phase shift mask blank or an extreme ultraviolet</u> mask blank, obtainable by the method of claim 1 and having a value of film stress of about 0.2 MPa or less.

30. (Currently Amended) [[A]] <u>An extreme ultraviolet</u> mask blank, comprising

a substrate and

one or more layers being deposited on said substrate by ion beam deposition, whereby the ~~photo~~ <u>extreme ultraviolet</u> mask blank with a very low value of film stress of about 0.2 MPa or less, and wherein at least one of said layers has a grain size of [[0]] <u>8</u> nm to 10 nm.

31. (Currently Amended) The <u>extreme ultraviolet</u> mask blank of claim 30, wherein said mask blank is characterized by being treated by irradiating with a second particle beam.

32. (Cancelled).

33. (Currently Amended) The <u>extreme ultraviolet</u> mask blank of claim 30, wherein at least one of said layers has a surface roughness of lower than 5 nm rms.

34. (Currently Amended) The extreme ultraviolet mask blank of claim 30, further comprising a light reducing layer.

35. (Currently Amended) The extreme ultraviolet mask blank of claim 30, further comprising an anti-reflective layer.

36. (Currently Amended) [[A]] An extreme ultraviolet ~~photo~~ mask manufactured from the extreme ultraviolet mask blank of claim 30.

37. (Currently Amended) An apparatus for manufacturing of a mask blank, comprising:

a vacuum chamber suitable for evacuation and in which a substrate and a target are disposable,

a deposition particle source for providing a first particle beam which is directable towards said target for sputtering of said target and depositing at least a first layer on said substrate and

an assist particle source for providing a second particle beam which is directable towards said substrate for treating of said substrate and cleaning a surface of said substrate from impurities by irradiating with said second particle beam before said deposition of said first layer, and

means for providing a reactive gas in said vacuum chamber at a predetermined pressure for enhancing said cleaning by said at least one reactive gas, in which the geometrical orientation of the substrate relative to the target, including the angle of incidence of the sputtered target atoms is adjustable to optimize the film stress to about 0.2 MPa, and at least one curved three grid ion extraction assembly together with a controllable radio frequency power.

38. (Previously Presented) The apparatus of claim 37, wherein at least one of said deposition particle source and said assist particle source provide an ion beam.

39. (Previously Presented) The apparatus of claim 37, wherein said deposition particle source provides a first ion beam and said apparatus comprises means for providing an electromagnetic field for accelerating and focusing said first ion beam on its way to said target.

40. (Previously Presented) The apparatus of claim 37, wherein said deposition and assist particle source are separately controllable.

41. (Previously Presented) The apparatus of claim 37, wherein said deposition particle source and said assist particle source are suitable to provide beams of at least one of

different directions,

different particles, and

different particle energies.

42. (Cancelled).

43. (Cancelled).